Washington Park Arboretum

BULLETIN

Published by the Arboretum Foundation

Fall 2017

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Washington Park Arboretum

The Arboretum is a 230-acre dynamic garden of trees and shrubs, displaying internationally renowned collections of oaks, conifers, camellias, Japanese and other maples, hollies and a profusion of woody plants from the Pacific Northwest and around the world. Aesthetic enjoyment gracefully co-exists with science in this spectacular urban green space on the shores of Lake Washington. Visitors come to learn, explore, relax or reflect in Seattle's largest public garden.

The Washington Park Arboretum is managed cooperatively by the University of Washington Botanic Gardens and Seattle Parks and Recreation; the Arboretum Foundation is its major support organization.

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The Arboretum Foundation's mission is to create and strengthen an engaged community of donors, volunteers and advocates who will promote, protect and enhance the Washington Park Arboretum for current and future generations.

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FALL 2017 VOLUME 79. ISSUE 3.

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ABOVE: American Robin in the fall foliage of a mountain ash at Washington Park Arboretum. (Photo by Larry Hubbell)

ON THE COVER: A Ruby-Crowned Kinglet on a big-leaf maple tree branch in the Arboretum in fall. (Photo by Larry Hubbell)

Sherrey (second from right) with friends at the ArbFest summer party in July.

Time for Reflection

As the Arboretum Foundation Board president, I am honored to be making a guest appearance in this column before handing the privilege over to the Foundation's new interim executive director, Jane Stonecipher.

In case you missed our email announcement, Jane joined the Foundation on August 7. As interim executive director, she will oversee the daily operations of the Arboretum Foundation and work with our board and staff to ensure that the Foundation continues to fulfill its mission to support the Washington Park Arboretum, including the Seattle Japanese Garden.

Jane will also work closely with our City and UW partners, on both day-to-day matters and major projects in the Arboretum. With her strong background in finance and business development, excellent leadership skills, and collaborative work style, Jane has immediately hit the ground running.

We had a busy summer at the Foundation. The second annual ArbFest party in July provided a unique opportunity for new and old friends of the Arboretum to mix and mingle, to experience the park in a fun and memorable way, and to raise some funds to support it. Our Moon Viewing event at the Japanese Garden in early September was another wonderful, sold-out event.

We've also continued our involvement with major Arboretum projects—such as the Loop Trail (now substantially complete) and the Centennial Garden (open since mid-September)—and with fundraising for the proposed Environmental Education Center. As we head into fall, planning is already under way for our ever-popular Opening Night Party at the Northwest Flower & Garden Show, to be held on February 6, 2018. (Please save the date!)

In the midst of all this activity, it's important to take some time for reflection as well. As a Foundation board member who lives across town, I am unable to spend as much time as I'd like simply exploring the Arboretum. I envy those who can more regularly stroll Azalea Way, seek respite from the blazing summer sun in the shady trails, or enjoy the tranquility of the Japanese Garden.

This spring and summer, though, I've been able to spend more time than usual here. It has been inspiring to witness, firsthand, just how many people visit this place on any given day—and the many different ways they use the Arboretum. I've also been able to observe both the progress on our current capital projects and how nicely the Master Plan projects of the past, such as the Pacific Connections Garden, have matured and come into their own. It has been truly gratifying to see the Foundation's broad impact throughout the Arboretum.

I recently had an opportunity to spend a few hours walking through the Arboretum with some "first timers," and seeing the place through their eyes reminded me of how truly impressive it is. For me, these experiences have reinforced my belief in how important the Arboretum is to the community, and how critical it is for all of us to care for it. Chatting with volunteers, meeting with Foundation staff, and spending time with other board members, I've seen how very much people love the Arboretum—and how committed they are to the Foundation's mission! I look forward to continuing to be a part of it all, and to working with you in the process.

Thank you for helping to sustain the Arboretum!

Sherrey

Sherrey Luetjen
President, Board of Directors
Arboretum Foundation

A SMORGASBORD OF NATIVES

Selecting Pacific Northwest Plants for Different Growing Conditions

TEXT AND PHOTOS BY DANIEL MOUNT

I have been gardening professionally in the Pacific Northwest for nearly 30 years and have seen horticultural fashion trends come and go. After a few extremely dry years, a Mediterranean plant trend arose, and—after a few mild winters—a desire for a lush *tropical-ismo*. Both of these movements have had lasting effects on how we make gardens here, but nothing has stood the test of time like the use of native plants.

This shouldn't be surprising, because our region is home to many beautiful, garden-worthy natives. What's more, these plants are adapted to our climate and provide optimal food and habitat for native wildlife, which most gardeners deeply appreciate. There are the stalwarts, such as salal, sword fern and vine maple, which once formed dense stands in the original forests that grew in the Puget Basin and are highly prized by landscapers for their amazing versatility. I have planted a fair number of them over the years, finding them useful, easy and lovely. But there are plenty of other natives that I have grown especially fond of as garden plants over the years.

For ideas, I look to a wide variety of our regionally native ecosystems. There seems to be an inclination among native plant gardeners to focus mainly on woodland natives, perhaps as a gesture to the once "original forest." However, the notion that a single, great, continuous old-growth forest covered our region in pre-colonial times is not accurate. Historically, the forests here were in various stages of succession, some regenerating from burns and others hosting 500-year-old mammoth conifers. There were also prairies, deciduous forests, wet meadows, bogs, swamps, and even remnant oak savannahs—and all were touched by human hands well before the Europeans ever arrived.

Our gardens, too, are a kind of patchwork of "ecosystems" or at least sites with varying microclimates—dry and shady, wet and sunny, and so on. We can look beyond forest habitats to find native plants that better suit some of these sites and, by doing so, broaden our palette and enhance the diversity of our gardens.

Native Plants for Different Microclimates

I recently took on a new gardening client. The five-acre estate is immaculately groomed and dominated by a meandering colonnade of Douglas firs, hemlocks and western red cedar. There are hundreds of rhododendrons, too—and some heather, camellias and viburnums, and many, many (way too many) *Spiraea* 'Magic Carpet'. But, as I walked the property, I found only one sword fern, a clump of sheared salal and a scraggly patch of Oregon grape. I immediately

ABOVE: Indian rhubarb (*Darmera peltata*) in the Woodland Garden at Washington Park Arboretum.

began forming a list in my mind of native plants to add to the garden.

Since the garden is already heavily planted with trees and shrubs, there is very little room for adding any more large, woody plants. So, I focused on plants of modest size, appropriate for most urban gardens.

Several opportunities and challenges presented themselves: The garden includes areas of dry shade under towering conifers and a deep swale in partial shade that stays quite wet. There is also an open, sunny area with average soil and an area with wet, well-drained soils under Japanese maples, along the edge of a heavily watered lawn.

Following are some of the plants I'm considering for these four different areas. My approach is inspired by Arthur Kruckeberg, who—in his seminal book, "Gardening with Native Plants of the Pacific Northwest"—recommends that "Good taste and an ecological eye should be the prime arbiters in growing native plants in people-oriented environments and landscapes."

Dry-Shade Conifer Zone

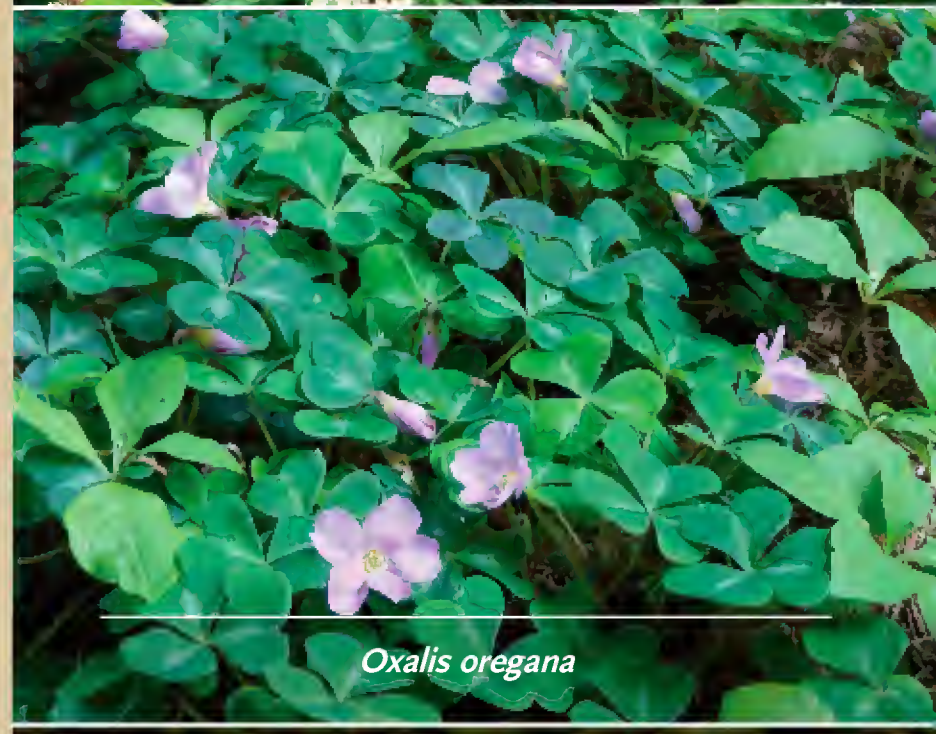
The base of a conifer tree is a tough spot for plants to grow, due to the lack of light and the competition with tree roots for moisture and space. At the same time, I think the earth looks too bald with nothing growing at the base of a tree, so I like to use foolproof plants that are adapted to these tough conditions.

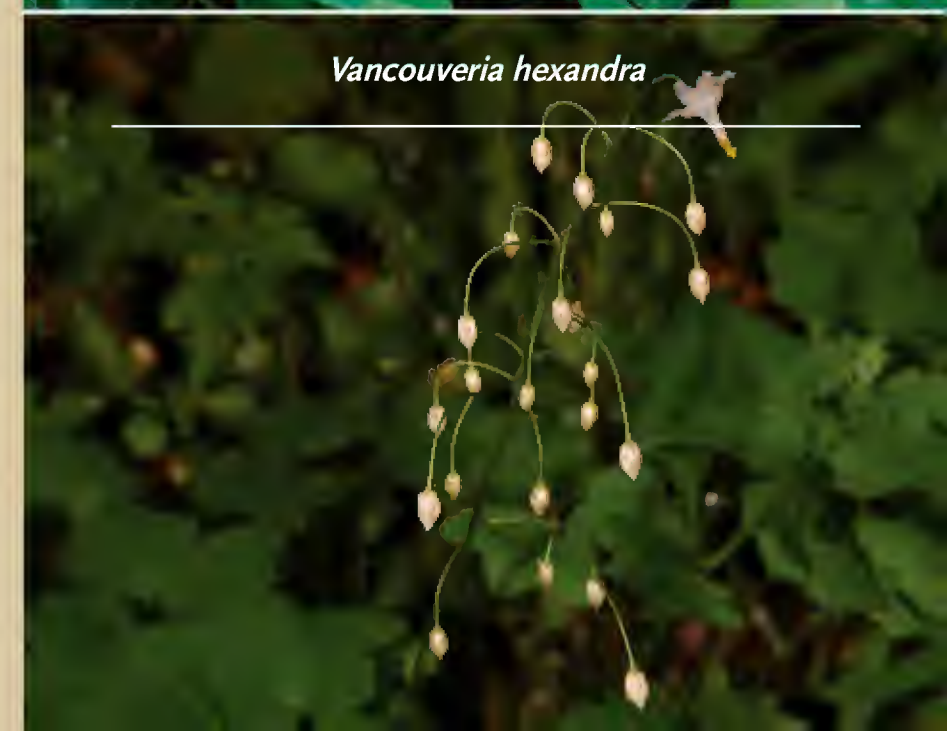
Myrtle boxwood (*Pachistima myrsinites*) is a wide-ranging understory shrub from western North America. In the Pacific Northwest, it prefers drier areas and is an ideal candidate for the base of our towering conifers. In appearance, it is quite close to boxwood or Japanese holly, but it bears small, red flowers. I planted some at the base of a fir tree in another client's garden, and they are doing great, despite having never been watered in 18 years!

Evergreen huckleberry (*Vaccinium ovatum*) is another fine shrub I plant again and again for its versatility; lustrous, fine-textured foliage; pretty flowers; and tasty berries. It does well in a woodland garden setting, where it can take the shade and root competition of larger trees with

Vaccinium ovatum

Maianthemum racemosum


Oxalis oregana


Vancouveria hexandra

minimal irrigation. Over time, it can grow over 10 feet tall. I have seen the plant sheared to form a hedge, though I would not recommend doing this.

Inside-out flower (*Vancouveria hexandra*) has a delicacy that belies its toughness. Everything about this plant says grace, from the dainty, epimedium-like white flowers in late spring to the small, ivy-like leaves that seem to hover above the ground on their wiry stalks. Like inside-out flower, false Solomon's seal (*Maianthemum racemosum*) is another forest ephemeral with a long period of interest. It puts on a great show, from the first emergence of its arching stems of oval foliage in early spring to the appearance of its plumy, white flower clusters in late spring to the red berries that form in late summer.

Its cousin, false lily-of-the-valley (*Maianthemum dilatatum*), is a lovely groundcover with spikes of delicate, white spring flowers. The glossy, heart-shaped leaves emerge in early spring and persist into fall. Tough as nails, it spreads where everything else sulks.

The creeping, rhizomatous Oregon wood sorrel (*Oxalis oregana*) forms an aggressive carpet beneath conifers. Some gardeners decline to use the plant for that reason, but I find its spreading ability in this situation an asset. Its velvety, shamrock-like leaves and cup-shaped lilac flowers are nice features, too. The evergreen cultivar 'Klamath Ruby' is a fine garden plant, whether you consider it a proper native or not.

Wet, Shaded Swale

Wet soil, though often seen as a limitation, has such potential for bringing lushness and drama into a garden. A number of large, attractive herbaceous perennials native to stream banks, seeps, marshes, and wet forest sites in the Pacific Northwest are perfect for this achieving this effect.

With its one- to two-foot-wide leaves, Indian rhubarb (*Darmera peltata*) lends a bold, almost-tropical look to any wet place in a Northwest garden. The showy, pink flowers emerge on long stalks in spring before the foliage.

Lupinus polyphyllus

Corydalis scouleri

Iris douglasiana

Heuchera cylindrica

Riverbank lupine (*Lupinus rivularis*) is that rare lupine that actually takes moist-to-wet soils. It is multi-branching and likes to sprawl, filling in large areas. In mid-spring, it sends up stalks of long-lasting, purplish flowers that are magnets for bees.

Scouler's corydalis (*Corydalis scouleri*) is a perennial I grow as much for its tall (up to three feet high), succulent, ferny foliage as its clusters of pink flowers. The plant is a bit of a runner, but plays well with others. Oregon goldthread (*Coptis laciniata*) is another plant I grow as much for its ferny foliage as its attractive, spidery, white spring flowers. Even more interesting are the space-age seedpods, arrayed in a whorl around the top of each stem.

Giant chain fern (*Woodwardia fimbriata*) is a choice and dramatically large, evergreen fern. Its lance-shaped fronds can reach over six feet long! I think it will be a good companion for the other tropical-looking plants in the swale. Speaking of large plants, goat's beard (*Aruncus dioicus*) is like a giant astilbe; its spikes of cream-colored flowers can reach up to six feet tall. The softness of its ferny, drooping foliage is very elegant.

Slough sedge (*Carex obnupta*) is a bit aggressive for the average-size garden, but it is such a nice-looking plant that I can't resist. It adds a wild-grass edge to any pond or swale, and it stays green—even during the driest spells.

Open, Sunny Zone

I have become more and more enamored with the South Puget Sound prairies over the years. The experimental restoration plots at Glacial Heritage Preserve look like gardens to me. I wonder why so few of these plants make it into our ornamental displays.

For a prairie planting, it's good to start off with some grasses. Idaho fescue (*Festuca idahoensis*) is a widespread perennial bunch grass from western North America. Very drought tolerant, it produces dense tufts of short, bluish-green leaves and makes a great companion for low-growing perennials. Tufted hairgrass (*Deschampsia caespitosa*) is another attractive native bunch grass with graceful, open flower panicles.

Rhododendron occidentale

Dicentra formosa

Aquilegia formosa

Deschampsia caespitosa
(Photo by Christian Fischer/Wikimedia Commons)

For taller perennials, I think I'd like to feature large-leafed lupine (*Lupinus polyphyllus*), which is one of the showiest and easiest of the 75 or so native lupines in our region. Its spires of blue-to-purple summer flowers reach up to four feet tall, and the plant seeds in freely, too.

I'll also have to mix in some Douglas iris (*Iris douglasiana*); it's the best of our native irises! Its nice, strappy evergreen foliage looks good all year. The spring flowers, which come in various shades of violet, are a lovely surprise.

In the shorter-perennial department, sea thrift (*Armeria maritima*) is a lovely, compact evergreen that looks almost grass-like when not in flower. It makes a great edging plant. The long-lasting, knobby heads of pink flowers in spring make it a choice addition to any garden.

Early blue violet (*Viola adunca*) is a very drought-tolerant and lovely member of the viola clan. Growing among taller plants, it is very happy to bloom early and vanish in the summer. Broad-leafed stonecrop (*Sedum spathulifolium*) is a compact evergreen perennial with waxy, gray foliage and yellow flowers on stout, reddish stems. Though diminutive, it has a very strong presence.

Moist, Deciduous Shade Zone

The conditions in this area seem almost ideal for gardening, as a combination of good drainage and plenty of water is hard to come by. Throw in the shade of deciduous trees, and it becomes something precious.

Oak fern (*Gymnocarpium disjunctum*) is a delicate, carpet-forming deciduous fern. I look forward to its emergence from the forest duff each spring. Roundleaf alumroot (*Heuchera cylindrica*) is not your store-bought, day-glow-colored heuchera. With its maple-like, dark-green leaves and tall spikes of white summer flowers, it has an understated, dignified beauty.

Pacific azalea (*Rhododendron occidentale*) is the loveliest of the three rhododendrons native to western North America. It is deciduous, and in addition to lovely, fragrant, white or pale-pink spring flowers, it has brilliant fall color.

Western bleeding heart (*Dicentra formosa*) likes to spread around and has a bit of a reputation for being aggressive—but it's nothing that a little elbow grease and pulling can't keep under control. And the effort is totally worth it for the lovely, pink-to-purple, heart-shaped flowers all spring—and for the ferny foliage.

Red columbine (*Aquilegia formosa*) is not as weedy at its European garden counterparts, but every bit as lovely—and it is a great attractor of hummingbirds. Pacific trillium (*Trillium ovatum*), though ephemeral—as most spring-blooming forest dwellers are in our native flora—is a great beauty, with its yellow-centered white flowers on foot-high stalks. It's easy to propagate and, contrary to popular belief, does quite fine in the dry understory of conifers.

In conclusion, this is hardly a definitive selection of natives. I haven't yet talked about long-leafed Oregon grape (*Berberis nervosa*) or fringe-cup (*Tellima grandiflora*) or one of my favorite shrubs: wavy-leafed silk tassel (*Garrya elliptica*). Or the miniscule American parsley fern (*Cryptogramma acrostichoides*). Or any of the orchids. (There are 14 native to our region.) Or the bulbs. Or the asters... Or...

As you can see, I could go on until I nearly exhaust the native flora of the Pacific Northwest. We may have only begun to imagine what a native garden might be. ~

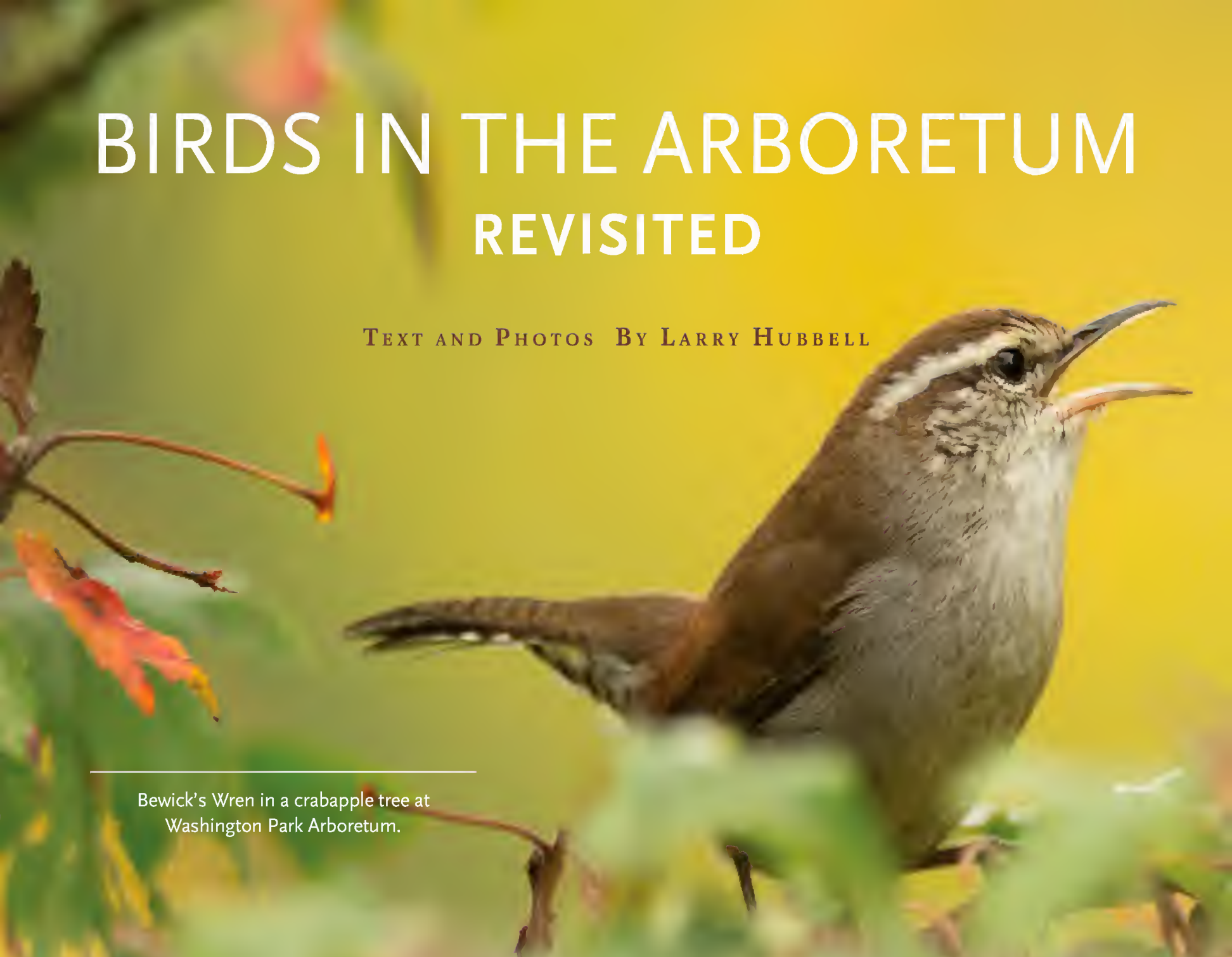
Daniel Mount is an estate gardener, garden writer, and member of the "Bulletin" Editorial Board. He lives on a small farm in the Snoqualmie Valley. Read more of his reflections on plants and gardening at www.mountgardens.com.

ERRATUM:

The article "Lost in Translation" in the Spring 2017 issue of the "Bulletin" erroneously stated that Daniel Mount's trip to Japan was organized by the Hardy Fern Foundation. The trip was actually organized by Kazuo Tsuchiya of Japan Specialized Group Tours.

BIRDS IN THE ARBORETUM
REVISITED

Text and Photos By Larry Hubbell



Bewick's Wren in a crabapple tree at Washington Park Arboretum.

In fall 1942, a young biologist named Earl J. Larrison wrote an article for the "Bulletin" entitled "Birds of the Arboretum." In it, he listed 133 species of birds, 79 of which he categorized as land birds and 54 as water birds. (You can peruse a copy of this "Bulletin"—Volume 5, number 9—in the Miller Library, at the Center for Urban Horticulture.)

In 2011, almost 80 years later, I began photographing birds in and around the Arboretum, and I continue to do so on a regular basis. Since the 1940s, the human population in Seattle has nearly doubled, and the world's population has tripled. Loss of habitat due to population growth in our city has no doubt affected the number of birds and species migrating through the Arboretum.

Between 1916 and 1966, much of the marsh and mud along the shoreline near the Arboretum, and to the north of Union Bay, was used as a repository for Seattle City waste. Moreover, across the U.S. the chemical DDT, which dramatically weakened the eggshells of predatory birds, was legally used until 1972.

Plus, over the years, there has been increasing competition from new species of birds (exotics and U.S. natives alike) that were not found in our region in 1942—for example, the European Starling, Barred Owl, Anna's Hummingbird, and lately, the Eurasian Collared-Dove. Under these circumstances, a decline in the number of native birds and bird species is not a surprise.

What is surprising is that most of the species Earl Larrison documented can still be seen in or around the Arboretum. In the last six years, I have personally photographed two thirds of Larrison's bird species here, and in the adjacent

Common Yellowthroat

Wilsons Warbler

Pacific Wren

Union Bay area. Many of the other species are still occasionally seen or heard. Although counts are generally reduced, as far as I know, all of Larrison's documented bird species can still be found in our Puget Sound neighborhood.

An Oasis for Birdlife

We, the current citizens of Seattle, owe a debt of gratitude to the University of Washington Botanic Gardens. The University staff and arborists care for the Arboretum's internationally renowned collection of trees, but they also manage the park to protect and enhance wildlife habitat. For example, over the years, snags of native trees (especially alders and cottonwoods) have been left as critical nesting and feeding habitat, and a significant subset of the marshland near Foster Island has been retained. (The UW staff must also be given credit for managing the Union Bay Natural Area on the north side of Union Bay, which opened in 1972 and was built over a portion of the Seattle City landfill.)

As part of the new Loop Trail construction, many native plants have been reintroduced, and streambed enhancements have been made in and around Arboretum Creek. In addition, the Seattle Parks employees and the Arboretum Foundation's Steward volunteers fight valiantly to keep invasive plants at bay in the Arboretum. I have no doubt the number of bird species in the Arboretum would be much lower without the efforts of these critically important people and organizations.

There have been some local success stories for raptors. Due in part to the regulation of DDT, beginning in early 1970s, Peregrine Falcons and

Pileated Woodpecker nestlings in a tree snag.

Anna's Hummingbird feeding its young.

Bald Eagles have returned to Union Bay—and the eagles, especially, are often seen and heard in the Arboretum. Last year, for the first time in over 80 years, Osprey nested and reproduced on Union Bay. Cooper's Hawks seem to have adapted to city life, and their numbers in the city appear be growing.

Bird species—such as Red-Breasted Sapsuckers, Turkey Vultures and Trumpeter Swans—that Larrison did not document are occasionally seen in or around the Arboretum. And many rarities not mentioned by Larrison have passed through the Union Bay area during the last few years. White-Fronted Goose, Red-Naped Sapsucker, Northern Shrike, Barrow's Goldeneye and Tufted Duck are a few that I have photographed.

Improving Avian Habitat

The challenge before us is how to reverse the overall declining number of bird species in and around the Arboretum. At least one major opportunity is coming our way during the next decade. I understand that once the new SR 520 Bridge is ultimately completed, the on-ramps from Lake Washington Boulevard will be fully removed, and the land beneath the ramps (the "WSDOT Peninsula") will become part of the Arboretum again. The central portion of this land is currently covered in rocks and temporary buildings, while it is being used as a staging area for the 520 construction. It's my personal hope that when this land is uncovered, at least some of it could be "redeveloped" into a variety of natural habitats.

Bald Eagle pair perched above Azalea Way.

Red-Breasted Sapsucker drilling holes in a tree trunk.

A parent and first-year Trumpeter Swan on Union Bay.

Locally speaking, shorebirds and marsh birds have been among the primary habitat losers over the years. Some examples of birds we seldom see, that might return to use these types of habitat, include Short-Eared Owls, Kestrels, Northern Harriers, and maybe even Snow Geese.

Future mitigation efforts stemming from the rebuild of the SR 520 Bridge—and indeed the construction of the new bridge itself—will have some positive impacts for birds and other wildlife. These include the rerouting of the 520 freeway runoff so that it no longer drains into Union Bay. This will help the fish that live in the currently polluted water, and the birds that eat the fish. They should all live longer, healthier, and more productive lives.

There is a plan to remove the culvert containing the lower portion of Arboretum Creek that currently prevents fish from going upstream. Also, the higher elevation of the new bridge over Foster Island will enable the growth of vegetation underneath. Finally, the combination of the bridge's higher elevation and its new, high-tech pavement will make Foster Island much quieter. This will help the birds save energy by lowering the required volume of their vocalizations. (It will also allow us to hear and enjoy more of their songs.) All of these changes will have a net positive impact on the avian life in and around the Arboretum.

We, the citizens who live around Union Bay and farther afield, might also reconsider the types

Osprey family nesting by Union Bay.

A pair of Cooper's Hawks in the Pinetum.

A young Barred Owl.

of plants, grasses and trees we allow to grow in our yards. Having a strong preference for native flora will help provide critical food, habitat and nest sites for native birds. Retaining mature trees and leaving snags in our yards would also help to provide nest sites and food sources.

Finally, we each could consider building bird boxes in our gardens. Residents with shorefront homes have especially productive opportunities. I am happy to offer suggestions regarding the optimal size and shape of nest boxes to any of my neighbors around the Arboretum. My email address is ldhubbell@comcast.net.

Larry Hubbell is a Seattle-based nature photograher specializing in the birdlife of the Union Bay Natural Area and Arboretum wetlands. See much more of his photography on his blog: http://unionbaywatch.blogspot.com/.

Name That Bird!

Here's a gentle challenge. Currently, about 10 percent of the species described by Earl Larrison in the 1942 "Bulletin" have been given new names, for one reason or another. Try matching up each of these old names with its replacement.

Old Names:

A. Red-backed Sandpiper
B. Whistling Swan
C. Holboell Grebe
D. Pigeon Hawk
E. Sparrow Hawk
F. Marsh Hawk
G. Russet-Backed Thrush
H. Western Flycatcher
I. Seattle Wren
J. Winter Wren
K. Bald Pate
L. Black Dominoed Yellow-Throat Warbler
M. Black-Capped Pileolated Warbler
N. Solitary Warbler

New Names:

1. American Wigeon
2. Bewick's Wren
3. Dunlin
4. Cassin's Warbler
5. Common Yellowthroat
6. Kestrel
7. Merlin
8. Northern Harrier
9. Pacific-Slope Flycatcher
10. Pacific Wren
11. Red-necked Grebe
12. Tundra Swan
13. Swanson's Thrush
14. Wilson's Warbler

The Name Key:

1 = K, 2 = I, 3 = A, 4 = N, 5 = L, 6 = K, 7 = D, 8 = F, 9 = H 10 = J, 11 = C, 12 = B, 13 = G, 14 = M

Fall Garden Care

Following Nature's Cues to Promote Healthy Soil and Plants

By Christina Pfeiffer

Change is in the air. In the Pacific Northwest, September brings a slight dampness to the air, with cooler nights and morning dew—sweet relief from the parched days of August. Most grasses and some perennials and evergreens respond with a bit of fresh growth. With the arrival of the autumn equinox, around September 22, days are noticeably shorter and a little less bright. The changing light and cooler temperatures signal garden flora and fauna to transition toward the dormant season. As shoot growth lessens and seasonal moisture returns, roots put on a flush of new growth. Old leaves, twigs, seeds and other debris drop to blanket the earth with a layer of duff—nature's mulch! This cover of natural debris protects the soil and offers overwintering habitat for beneficial insects, fungi and other organisms—those masters of decomposition that work to recycle organic matter and nutrients back into the earth.

A common reaction to the fall season is to scour garden beds clean of fallen leaves and plant debris—a practice that is counterproductive to natural processes and may leave soil and garden plants more vulnerable to the vagaries of winter. To promote a healthier garden and save some effort, heed nature's cues and garden in sync with the season.

Fall Garden Care

Plant!

That fall flush of root growth makes this a great time for planting and transplanting. From bulbs to trees, fall planting gives roots a jump-start on establishment in preparation for the demands of supporting top growth and moisture needs next season. Rainfall and cooler temperatures reduce watering requirements the first weeks after planting. While some woody plants and perennials are better suited to spring planting, most landscape plantings done in the fall and dormant season fare better, experiencing less drought stress during their first summer. Fall is also an ideal time to divide many perennials, grasses and ferns.

Proper planting techniques are essential for avoiding common causes of transplant failures. Two common mistakes are leaving tight root balls undisturbed and planting too deep (particularly for trees). All types of nursery stock need some gentle root disturbance to put white root tips in direct contact with the soil bed, and to stimulate growth. Planting holes are best prepared shallow and wide, and care should be taken to place the trunk flare of shrubs and trees at, or slightly above, grade. Planting slightly "proud" in this manner allows room for potential soil settling and future mulch applications—helping prevent buried trunks, which can cause girdling roots and plant stress and lead to early death.

Manage Weeds

Those same conditions that make fall a great time for planting in the garden also favor weed plants. Stinky Bob, dead nettle and shotweed are among those that germinate in fall and lie in wait for spring to explode into growth. Applying mulch over them as small seedlings will go far in eliminating their rampant spread in spring. Take a sweep through the garden now for weeds large and small to thwart their presence in the spring garden.

Fall Soil Care

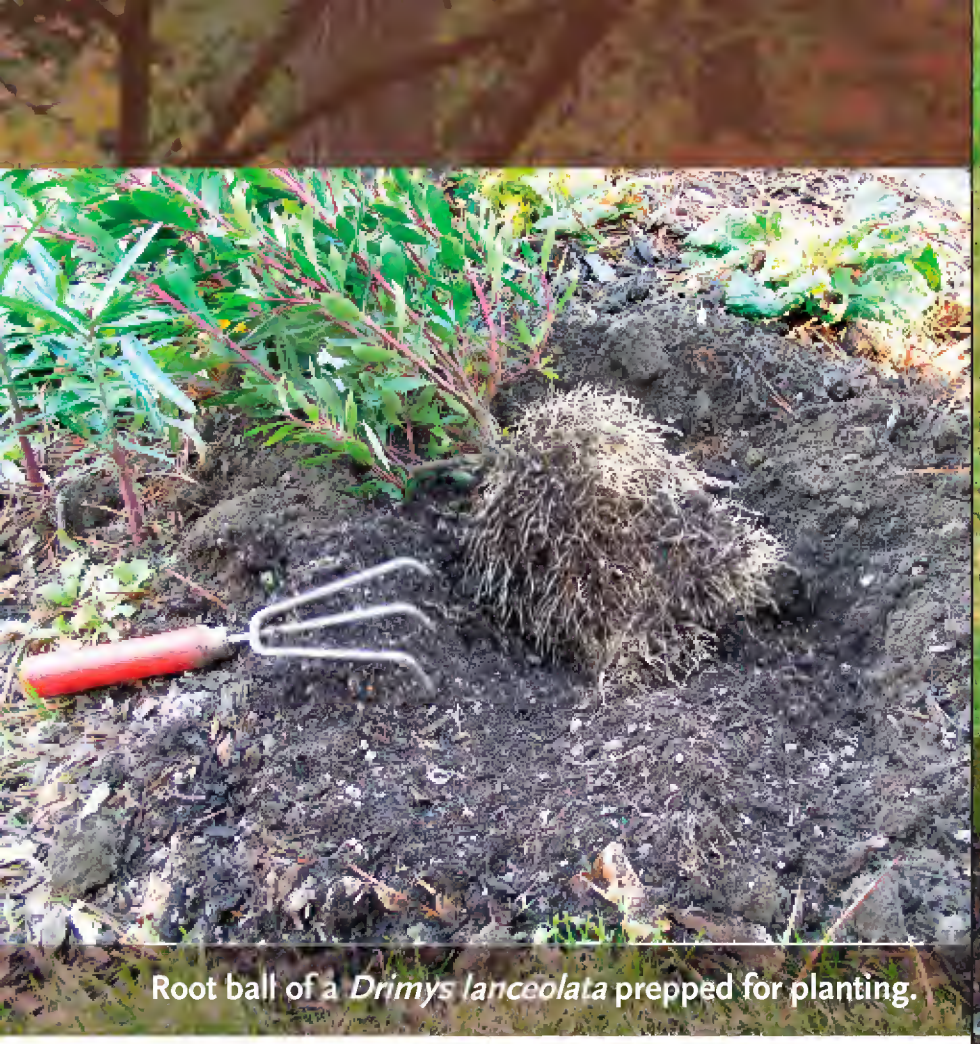
Early fall offers a window of time when soil is neither bone dry nor sopping wet and can be cultivated with good results. This is a great time to prepare new planting areas, and to incorporate any needed compost or other amendments. Gently cultivate the upper inch or so of crusted soil surfaces before applying any compost or mulch. Don't dig, cultivate or tromp wet soil; it will damage the structure and leave the soil compacted and less suitable for good root growth.

Bare soil is subject to erosion and compaction from the impacts of heavy rain. Storm water runoff is more intense when the soil surface is crusted or compacted because less moisture can penetrate deep into the ground. So don't clear out all the leaves and debris down to bare ground; do what nature does this time of year—mulch!

Fall Mulch as Effective Multi-Tasking

Applying a course-textured organic mulch to your planting beds is one of the best things you can do to maintain good soil structure and root health. Coarse mulch laid down in early fall will protect against soil compaction and erosion, suppress winter weeds, improve water penetration over winter, and retain that moisture well into the next growing season. Weeds are much easier to pull from the well-conditioned soil beneath good mulch. Decomposing mulch acts as a slow-release fertilizer while returning valuable humus to the ground. Coarse organic mulch supports a variety of beneficial insects, worms and fungi, which in turn facilitate good conditions for root growth. The single task of spreading mulch in autumn will improve soil and plant health while reducing future needs for weeding, watering, fertilization and cultivation.

When cleaning up heavy loads of fallen leaves in the garden, keep as much leaf debris at soil level as you can and save the excess leaves to compost for later use. Leaf mold—shredded and partially composted leaves—is one of the best materials for garden mulch: It is rich with nutrients and supports an array of beneficial organisms. While foliage from trees infested with leaf blights such as anthracnose should not be recycled in the garden, most garden leaves offer more benefit than potential problems. Gardeners who



Root ball of a *Drimys lanceolata* prepped for planting.

A young tree planted "proud" and freshly mulched.

Apply mulch over weed seedlings in fall to suppress their growth in spring.

have switched to incorporating leaves into their garden mulch have seen improvements in plant health and appearance, even after the first year.

Wood chips generated from shredded tree trimmings (the primary material used at Washington Park Arboretum) are a great mimic of nature's duff layer and are ideal for use around trees and shrub beds. Apply coarse-textured mulch three to four inches deep over bare soil to improve rain infiltration and protect against compaction. As mentioned already, never bury the trunks of trees and shrubs; it is harmful to their health and invites basal rot. Mulch should taper down to soil level next to stems and trunks.

Pruning

Overall, there is minimal need to prune woody plants at this time of year. Save routine pruning of flowering and other ornamental shrubs for the dormant season—late winter. (Most flowering shrubs can also be pruned immediately after blooms fade.) Early fall is a good time to inspect large trees for any large dead branches that would best be removed before the winter storm season. The seed heads from many annuals, perennials and ornamental grasses that gardeners may whisk away to tidy things up may have more function left in them; consider keeping some in place for visual interest, and as forage for birds.

Down to Earth

In its own subtle way, fall is as potent a season as spring in our gardens. As you head out to tend your yard this autumn, follow nature's cues, paying special attention to the wealth of activity happening at ground level. The tasks I've outlined here are the foundation for garden beauty and vitality all year long.

Christina Pfeiffer is a horticulture consultant and educator, and a member of the "Bulletin" Editorial Board. You can find more tips and techniques for gardening with the seasons in her recent book, "Pacific Northwest Month-by-Month Gardening: What to Do Each Month to Have a Beautiful Garden All Year" (Cool Springs Press, 2017).

Seasonal Glory

By Lynn Schueler

ABOVE: *Viburnum opulus* 'Nanum' putting on fall color in the Pat Calvert Greenhouse.

The Pat Calvert Greenhouse sells young trees, shrubs and perennials grown from seeds or cuttings taken primarily from the collection plants at Washington Park Arboretum. It is, without doubt, one of the best places in the region to find unusual plants for your garden—and all plant purchases directly support the maintenance needs and kids' environmental education programs at the Arboretum.

The Greenhouse is a volunteer-run operation, and has been since it opened in 1959. All the volunteers have their own favorite plants that they work with. Following are some of my favorite trees and shrubs with fall interest that we propagate. Most of them have multiple seasons of interest. Come and see them out in the Arboretum and, if one takes your fancy, stop by the greenhouse—just to the south of the Graham Visitors Center, to take a little piece of the Arboretum home with you.

Orangebark Stewartia

Stewartias are known as four-season plants. In winter, interesting peeling or mottled bark catches the low, slanting sun. Spring's warming days bring attractive leaf buds that pop open to reveal delicate, fresh leaves. Cup-shaped white flowers with fluffy yellow stamens decorate the graceful branches in summer, with *Stewartia pseudocamellia* var. *koreana* boasting the showiest blossoms. But the star of the genus for autumn is *Stewartia monadelpha*, the orangebark stewartia—with its reliable, rich orange-red, maroon or brilliant-red foliage that glows in the shortening days of fall.

FAVORITE FALL-INTEREST PLANTS AT THE PAT CALVERT GREENHOUSE

The Pat Calvert crew has collected seed from the four stunning specimens of this plant that grow just north of the New Zealand Forest and east of Lookout Gazebo. Over 70 years old, these small trees range from 25 to 50 feet tall and 20 to 30 feet wide. A seedling will probably reach 10 to 15 feet tall in 10 years. Perfectly hardy in the Puget Sound, *Stewartia* is easy to grow in regular garden soil in sun or light shade.

Crape Myrtle Cultivars

In the 1990s, the beds in the parking lot at the Center for Urban Horticulture were renovated and planted with a display of crape myrtle (*Lagerstroemia*) cultivars, much to the delight of the greenhouse volunteers. We had been restricted to two cultivars in the Arboretum for our cuttings (both hybrids of *Lagerstroemia indica* and *L. fauriei*), but now we have access to a wide variety of cultivars. Crape myrtles are deciduous small trees or large shrubs from Asia and northern Australia, with large clusters of crinkly-petaled flowers of white, pink, red, lavender or purple that bloom from late summer to fall. In autumn, the leaves flame brilliantly in the full range of possible colors—yellows, oranges and reds—depending on the cultivar. The attractive bark (often peeling, but also mottled or smooth) is a winter bonus.

The Arboretum's plants are easy to find. Look for *Lagerstroemia* 'Natchez' at the north end of Graham Visitors Center parking lot, with its huge, white flower trusses and yellow to red-orange fall foliage. Not far to the west of this specimen, at the north end of Azalea Way, you'll see three

tall, narrow, tree-size *L.* 'Muskogee' in a tight cluster. You may not notice their lavender flowers way at the top, but you will definitely appreciate the trees' vertical trunks and light, gray-brown bark, as well as their red-orange fall color. Crape myrtles are heat-lovers and like a warm spot to perform well; the reflected heat from the parking lot helps the Arboretum's 'Natchez' bloom so profusely. The taller, tree-like forms of *Lagerstroemia* are often used in parking strips. Provide your crape myrtles with full sun, good drainage and moderately fertile soil, and they will reward you with a glorious fall display.

Fall foliage of *Stewartia monadelpha* in the Arboretum. (Photo by Joy Spurr)

Fall color on *Lagerstroemia* 'Muskogee' in the Arboretum. (Photo by Joy Spurr)

Sorbus forrestii

The Brian O. Mulligan Sorbus Collection in Washington Park Arboretum is located along the east side of Arboretum Drive, a lovely short stroll from Graham Visitors Center. One of the most complete collections of *Sorbus* in the nation, it was named for the former director of the Arboretum. The genus *Sorbus* is divided into two groups: the whitebeam or rowan, which bear simple leaves, and the mountain ash, which bear pinnate leaves (compound leaves made up of rows of leaflets). *Sorbus forrestii* is said to have been one of Brian Mulligan's favorites. This small, deciduous mountain ash from western China has rich, blue-green leaves that turn brilliant reds and oranges in fall and clusters of white flowers that bloom in spring. In autumn, large, white (non-edible) berries with dark-pink tips develop and hold on well into winter. Our specimens (there are two in the Arboretum altogether) date back to 1995 and are about 10 to 15 feet tall and wide. Sorbus grow well in the Puget Sound region in regular garden soil and sun or light shade.

Evergreen Osmanthus

No, they don't have fabulous foliage fireworks. No, they don't have big, beautiful berries in the late season. But the little white flowers of *Osmanthus* pack an amazing fragrance, the kind that wafts through the air and makes you look around, sniffing, wondering where that lovely scent is coming from. Evergreen osmanthus, often quite large shrubs, have neat, attractive foliage (sometimes variegated) and are usually used as background shrubs or hedging. Two autumn bloomers we love are *Osmanthus heterophyllus*, a Japanese species with holly-like leaves, and *O.* × *fortunei*, a hybrid of *O. heterophyllus* and the Asian *O. fragrans*. You'll find both at the Greenhouse, plus two stunning variegated selections of *Osmanthus heterophyllus*: 'Variegatus', which bears cream-edged, dark green leaves and grows eight to ten feet tall, and 'Goshiki', which has green leaves splotched with yellow and grows slowly to five feet tall and wide. Both variegated plants are late-season stars in the Witt Winter Garden at the Arboretum. Osmanthus grow well in regular garden conditions in our area.

Viburnum opulus 'Nanum'

The genus *Viburnum* has many candidates for the autumn garden that sport colorful leaves and berries. Most viburnums are large shrubs, but *Viburnum opulus* 'Nanum' makes an appealing, dense, two- to three-foot-tall, spreading mound of maple-shaped leaves, often tinged burgundy in spring and turning burgundy to vibrant red in fall. Rarely flowering, this little shrub is grown for its form and foliage and looks best in a shrub or mixed border as a companion with other plants. There is a cluster of them near the north end of the Graham Visitors Center parking lot, a chal-

Osmanthus heterophyllus 'Variegatus' offers fall fragrance and foliage interest. (Photo by Niall Dunne)

lenging spot to grow any plants because of car and foot traffic. Viburnums are easy to grow in moist garden soil in sun or partial shade, but this cultivar does not like to get too dry.

Winterberry and *Ilex serrata* cultivars

These two deciduous hollies hail from opposite ends of the world: *Ilex verticillata* (winterberry) is a suckering shrub that grows at the edges of woods or in swamps in the eastern and central U.S., as well as north into Canada, while *Ilex serrata* is a bushy plant that grows wild in Japan and Sichuan, China. Luckily, they grow well together. And they are compatible on other levels, too: Selections have been made from each species, and crosses between the two have yielded yet more plants. Both species and their cultivars bear male and female flowers on separate plants, so when you pick a female clone for its attractive berries, be sure you also plant a male clone to pollinate her. One male plant can pollinate several female plants, and you can tuck him into the back of a cluster so you just see the berry-producing clones. Just make sure he's within 10 feet of your female plants.

In the Arboretum, berries of these *Ilex* start coloring in October before leaf fall, when they contrast nicely with the green foliage. (And the berries last well into winter, creating a striking glow through a dusting of snow.) At the greenhouse, we have *Ilex* 'Harvest Red', a female hybrid that forms a vigorous, irregularly rounded

Winterberry (*Ilex verticillata*) fruits and foliage. (Photo by SB Johnny/Wikimedia Commons)'

shrub about 10 feet tall and wide—which bears abundant, bright-red berries and red-purple fall foliage. We also sell *Ilex verticillata* 'Sunset', a female cultivar that grows up to eight feet tall and wide and produces copious amounts of large, red berries. For pollination, we have an unnamed dwarf male clone that blooms over a long period of time and grows up to four feet tall and wide. Best grown in moist soil in full sun, these hollies also tolerate heavy and wet soils, but their leaf edges will crisp if conditions are too dry. ❧

Lynn Schueler has volunteered with Pat Calvert Greenhouse and at Arboretum Foundation events for 21 years. During that time, she has learned about many amazing plants in the Arboretum. She also cherishes the friendships she has made with her fellow volunteers over the years.

Hidden Treasures of the Arboretum

Euptelea polyandra

By Walt Bubelis

Euptelea polyandra is a small, deciduous tree with attractive foliage resembling that of a linden (*Tilia*) or arrowwood viburnum (*Viburnum dentatum*). The large, round, jagged-edged leaves are held on slender stems and taper sharply at the tip. In fall, they catch the eye by turning pretty shades of red, yellow and brown.

The foliage is the main draw, but the early-spring flowers are also appealing. The flowers emerge on bare branches before the leaves appear. They lack petals and sepals, but feature dense, drooping clusters of large, bright-red anthers. The flowers develop into small, flattened, elongated samaras (winged seeds) that are dispersed by the wind.

Euptelea polyandra grows wild in riparian forests in south-central Japan, at elevations between 300 to 4800 feet. In its home range, it's an understory tree of disturbed ground in shaded glens. Historically, in times of famine, the leaves of the tree were boiled and eaten.

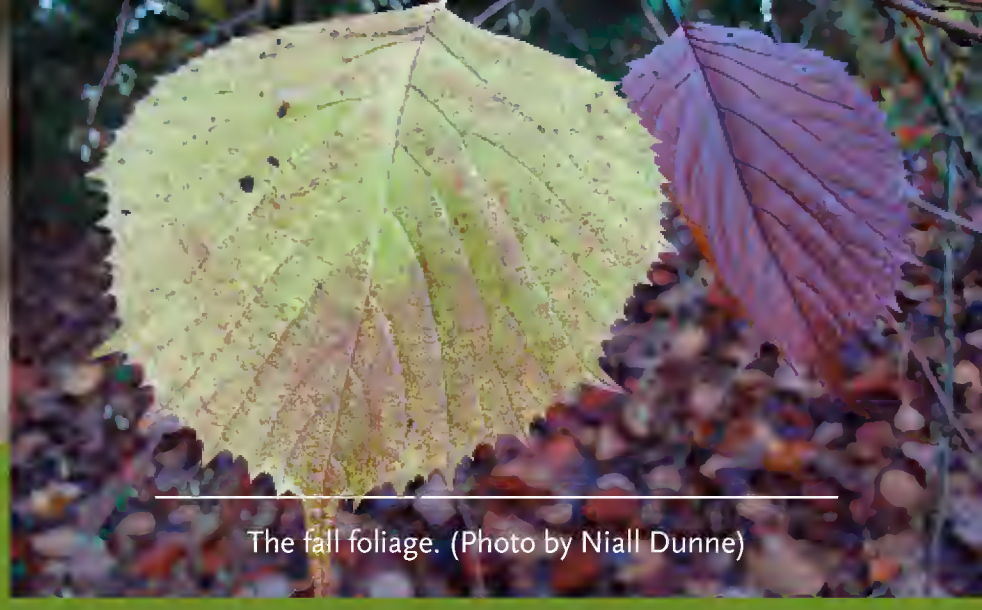
Euptelea polyandra is one of just two species in its genus, the other being *E. pleiosperma*, a native of India and China. The genus name combines the Greek *eu* meaning "well" or "handsome" and *ptelea*, an ancient Greek name for "elm." *Euptelea* leaves do resemble those of some elms—thus, "handsome elm."

Euptelea belongs to the family Eupteleaceae, which is comprised entirely of the genus *Euptelea*. For fans of technical terms, the family is "monogeneric." Its closest relative is Cercidiphyllaceae, of katsura tree fame.

Growing Euptelea

Euptelea polyandra is rare in cultivation here. Besides the specimens in the Arboretum (of which there are two), I've only seen it growing locally at the Kruckeberg Botanic Garden, and in

The spring flowers. (Photo by Σ64/Wikimedia Commons)



The fall foliage. (Photo by Niall Dunne)

Spotlight on the Collector

One of Arboretum's two *Euptelea* specimens came from Frank Doleshy, a consummate plant collector who traveled many times to Japan and Korea. Although rhododendrons were Frank's main interest, he collected many other plants, too. His extensive garden in Woodway, Washington testified to his eclectic interests. I've also heard of his travels up Mount Kinabalu (Borneo's highest peak, at 13,435 feet) to collect specimens along the way, particularly of the tropical section of rhododendrons—the Vireyas. These he kept in his greenhouse, under a large stand of mature grand firs. University of Washington Botanic Gardens Curator Ray Larson found in the records that Frank donated seed of many species to the Arboretum. A search revealed that there are still two rhododendron species here from seeds that Frank collected in 1965 on an expedition to Yakushima, an island off the south coast of Japan.

a couple of private home gardens (one of which acquired its plant from the MsK Nursery at the Kruckeberg Garden). But it deserves more attention because it would make a fine small street tree or specimen planting in a shade garden.

The species typically grows from 20 to 25 feet and has a single trunk. It prefers moist, rich soils but can adapt to a variety of soil types. It can also take sun or semi-shade. An excess of shade will cause the plant to reach for light and become fairly narrow in outline. Sunlight will bring out the best fall colors—an attractive maroon to light purple. In shaded conditions, yellow fall foliage is more typical.

Euptelea polyandra is hardy to USDA Zone 6. The normal way to propagate it is to sow the seeds as soon as they are ripe in late spring.

In the Arboretum

The two specimens at Washington Park Arboretum grow side by side—just to the north of the Magnolia Collection, on the west side of Arboretum Drive.

One is a 25-foot-tall tree with a single trunk that came to us in 1985 as a young plant from the U.S. National Arboretum in Washington D.C. It was planted out in the Arboretum in 1990. The seed for the tree was originally collected on the island of Hokkaido, Japan.

The second specimen, though older, is only about 12 feet high. It came to us in 1975 as a seed collected by Frank Doleshy in the Jindai Botanical Gardens, in Chofu, a suburb of Tokyo. It was planted in the Arboretum in 1983. Like its neighbor, it once had a large, single trunk; but this was cut down after a wet snowfall caused extensive damage. Multiple trunks re-sprouted from the main stem, producing a shorter, shrubby plant.

Come visit this rare, understated species and see if it takes your fancy. Its attractive foliage is reason enough to recommend it. At least one online nursery (forestfarm.com, based in Williams, Oregon) offers young plants for sale. ~

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Q&A from the Miller Library's Plant Answer Line

The Gall of that Plant!

By Rebecca Alexander

This regular column features Q&A selected and adapted from the Elisabeth C. Miller Library's Plant Answer Line program. If you'd like to ask a plant or gardening question of your own, please call (206) 897-5268 (UW Plant), send it via the library website (www.millerlibrary.org), or email directly to hortlib@uw.edu.

QUESTION: I found a strange growth on my rose bush that looks like a tangled ball of reddish hair. A friend says it's a rose gall. What causes it? Will it be harmful to the rose?

ANSWER: If the growth is not sharp and spiny, but softer, what you have is most likely a moss gall, also known as Robin's pincushion gall or rose bedeguar gall. This gall has been wondered over by humans since ancient times. Hippocrates, Pliny, Aristotle and Theophrastus studied it. The term "bedeguar" comes from the Persian *bãd ãwar*, which refers to a kind of thistle (which the gall resembles) but literally means "brought by wind."

What Causes the Gall?

Female cynipid wasps (*Diplolepis rosae*) cause this type of gall, as well as the spiny rose gall. The tangled ball you observed is made of an outer gall around a larval chamber and may contain a number of inner galls. Moss galls usually appear on rose leaves, but sometimes can occur on the stems. They are more commonly found on wild roses than cultivated ones. Warm, dry summers favor their development. If you are curious, remove the gall and cut it open. You will see chambers inside, where the tiny wasp larvae are housed.

According to Margaret Redfern's book "Plant Galls," adult cynipid wasps emerge in late spring or early summer and lay their eggs into leaf buds or young leaves. The eggs hatch, and the larvae start to feed on the plant. This stimulates the formation by the host plant of a nutritive layer of cells around the larvae upon which they continue to feed, plus it stimulates the development of further concentric layers of cells, including the hair-like, epidermal filaments that surround the exterior of the gall. By late summer or fall, the larvae are full grown. They overwinter in the gall in a pre-pupal stage and then pupate in spring before emerging from the gall to begin the life cycle again.

Sometimes other insects will parasitize the chambers in the gall, and there are even "hyper-parasites" on those parasites—so the gall acts as a small ecosystem. Rose bedeguar can be useful to many creatures—even vertebrates, such as birds and small mammals, which break open the galls to eat the larvae. The larger the gall (and they can be as large as a golf ball), the more noticeable and attractive it is to vertebrate predators.

Will It Harm the Rose?

Moss galls do not cause significant harm to the rose. The book "Common Insect and Mite Galls of the Pacific Northwest" refers to galls generally as "plant sinks," meaning that they redirect resources away from the plant and toward the parasite. There are types of galls—those caused by fungi or bacteria—that do considerable damage, but "few gall-forming mites and insects are considered pests" because they tend to occur in small numbers, "cause little vascular blockage,

Moss gall on a rose plant. Inset shows cross section of gall with larval chambers. (Photo by BJ Schoenmakers/Wikimedia Commons)

and/or sap relatively small amounts of nutrients from the host plant."

Other Uses of Galls

There are other galls that have been useful to humans. Some cynipid oak galls contain high levels of tannins and were used in making permanent ink, dyeing cloth and hair, and in tanning animal hides for leather. Theophrastus describes the use of a resinous gall ("Bassorah," or Basra gall) to light lamps, and yet another type of woolly-looking gall that could be used as a wick.

There are examples of galls used as food by humans. The best known is corn smut fungus (*Ustilago maydis*). It is known in Mexico as *huitlacoche* and may be used as filling in quesadillas, and in other dishes. It has a truffle-like flavor and adds protein to the corn. A type of cynipid gall found on oak has been sold as fruit in Mexico, and the nectar of a gall found on *Salvia* was mixed with honey or sugar and proffered as a sweet delicacy in village markets in Crete and parts of the Middle East.

Galls also have a history of medicinal or superstitious uses. Dried and powdered rose bedeguar was believed to cure toothache, and placing a gall underneath one's pillow was supposed to induce slumber. Botanist and

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2

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Witches' broom on a cherry tree.
(Photo by Rosser1954/Wikimedia Commons)

herbalist John Gerard (1542–1612) thought "oak apples" foretold the future. If an ant were found inside the gall, it would be a good year for grain, but a worm meant famine. A spider foretold a pestilence, and a fly meant war was coming.

Other Galling Topics

Witches' broom: If you have ever looked up in a tree and seen a round cluster of twiggy growth, there is a good chance you've encountered a type of virescence, a term (meaning "becoming green") for any distorted or oddly shaped growth of plant parts. In herbaceous plants, this kind of anomalous growth is called phyllody, phyllanthy or chloranthy. Virescences may be caused by viruses, microorganisms, phytoplasmas, bacteria, fungi, parasitic plants, mites or insects. Witches' brooms are not necessarily a bad thing and may even be a boon. For instance, ornamental horticulture takes advantage of the genetics of witches' brooms to develop dwarfing forms of conifers. Birds and squirrels take shelter in the nest-like structures of brooms.

Figs and fig wasps and pollination: We think of a fig as a fruit, but it is actually a specialized structure called a synconium that encloses multiple inverted flowers. The flowers are not accessible to wind or bees, so many fig species rely on fig wasps for pollination. In an example of a co-evolved mutualism, the wasp lays its eggs inside the synconium, and each developing larva relies on the ovary walls of a female fig flower for nourishment. The synconium itself is not deformed in any way by the presence of the wasp eggs, so it is not a gall in the way that rose bedeguar is. But still, since the fig wasp brings about the formation of endosperm (food tissue) when it deposits an egg inside an individual fig flower, the modified flower is like a tiny gall. ~

Rebecca Alexander is the Plant Answer Line librarian at the Miller Library, located in the UW Botanic Gardens' Center for Urban Horticulture (3501 NE 41st Street, Seattle). She is also a contributing editor to the "Bulletin."

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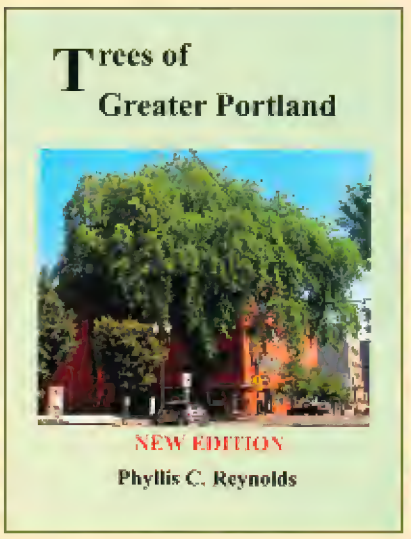
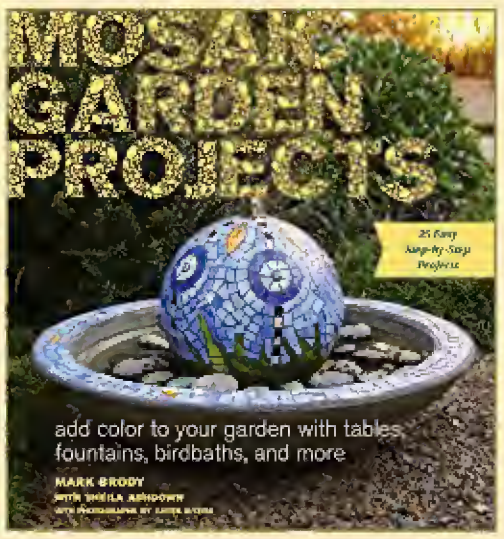
In a Garden Library

New Books *for* Pacific Northwest Gardeners

By Brian R. Thompson





Trees

What would it be like to spend a whole year observing a forest, examining the changing seasons and all the beings—plants and animals—that lived there? This is exactly what Lynda Mapes, a science reporter for "The Seattle Times," decided to find out. She lived on the edge of the Harvard Forest, a 3000-acre managed-research forest in Petersham, Massachusetts—over 60 miles west of the main Harvard campus. "Witness Tree" is the story of this undertaking.

To focus her attention, Mapes concentrates on a single tree: a northern red oak (*Quercus rubra*), of early middle age for this species. She examines the hundred-plus-year-old tree in every conceivable way, with the help of experts from many professional and avocational perspectives. She also considers the humans that interact with the tree and the forest, including the cultural history of the area and its impact on the natural history.

Throughout, there is an ongoing consideration of climate and other changes in the forest. Mapes takes both the long view, over millennia, and also looks at more recent changes, such as the invasion of the hemlock woolly adelgid (*Adelges tsugae*) and the near demise of such forest stalwarts as the American elm (*Ulmus americana*) and the American chestnut (*Castanea dentata*). Some of this narrative Mapes presents from the imagined perspective of her beloved red oak.

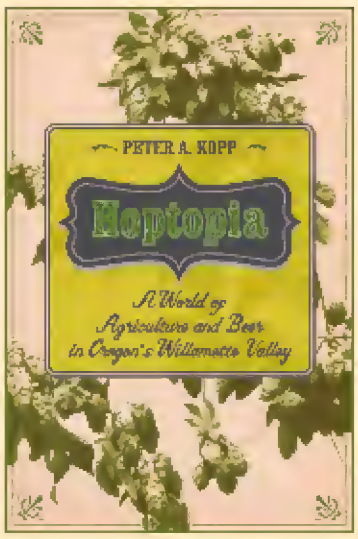
Mapes stayed in New England during the winter of 2014–15, one of the coldest and snowiest on record. She writes, "While I froze in the Northeast, my husband at home in Seattle was cutting the grass and watching flowers burst forth in the warmest winter on record." Contrasts like this, and the author's gentle role in teasing them out of the world around her, makes this a very satisfying book.

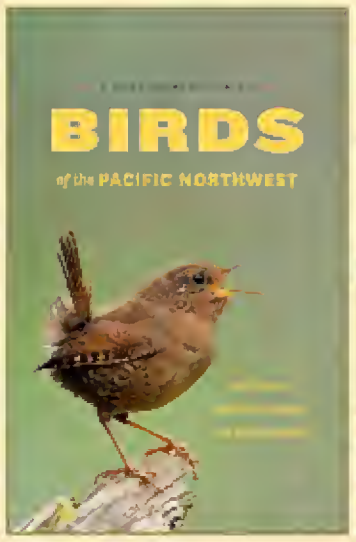
Phyllis Reynolds co-wrote "Trees of Greater Portland" back in 1993. Twenty years later, she has written the second edition of this worthy guide to urban trees, narrowing her definition of "Greater Portland" so that most of the subjects now included are within the city limits.

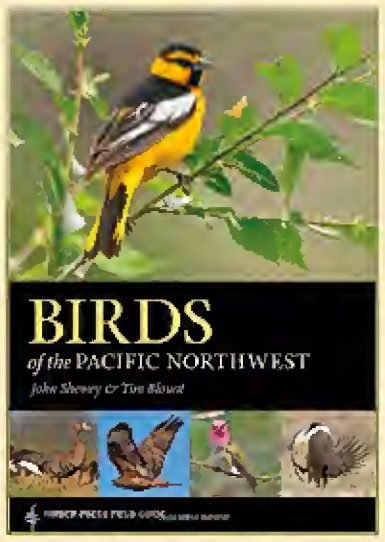
She revisited and re-photographed all the trees from the first edition—or nearly all of them. Sadly, some trees are now gone and had to be removed from the book. But Reynolds also adds some new ones to the second edition. I found it fascinating to compare the photographs of the same tree in the two editions after 20 years' more

growth. One of the most remarkable is a *Malus* × *domestica* 'Yellow Bellflower', a winter apple with pale-yellow fruit. Thought to be planted in 1848, the tree still blooms and bears fruit.

For the Portland resident or visitor, the nine tree tours at the end of each book will be of most interest. These are in neighborhoods especially rich with notable trees, many profiled earlier in the book. To sharpen your recognition skills, the author only identifies one example of each species on the walk, as she explains, "This should be a learning experience."







Cut-Flower Farming

"Floret Farm's Cut Flower Garden" is an excellent handbook to creating and running a very successful cut-flower business on the model of Floret Farm in Washington's Skagit Valley. However, if your goals are not quite so ambitious, there is still a lot of advice here for creating a cutting patch in your own garden and using the bounty for filling vases and many other purposes.

Primary author Erin Benzakein speaks from a lot of experience. Her farm began as a big patch of sweet peas, grown in memory of her beloved, gardening great grandmother. Friends requested cut flowers. The tears and emotional memories evoked in one recipient was an epiphany for Benzakein. "In that moment, I realized that I'd found my calling. Witnessing the profound impact that a simple bouquet could have on a person, I knew I had discovered something worth pursuing."

While the introduction prepares the reader for both the cultural and business side of cut flowers, the core of the book is the author's description of her favorite flowers and her hard-earned experiences with each. And she doesn't just talk about cultivating beautiful flowers! Benzakein encourages growing at least as many plants for their leaves, seedpods, colorful branches, and other features to be the supporting cast for your arrangements—or stars in their own right. She encourages the use of grasses, shrubs, trees, and even vegetables in your cutting plans; a spray of tomatoes—in various stages of ripeness—has considerable ornamental value.

Benzakein includes lots of ideas and inspiration for projects, as well as step-by-step instructions for arrangements featuring both fresh and dried flowers—and not just for centerpieces, bouquets and vases. The most striking photo (and there are many) in the book is of the author wearing a spring crown of ranunculus, viburnum, muscari and campanula!

Garden Mosaics

"Mosaic and garden design have similar characteristics. They are each made of an assembly of pieces laid out in a certain way." This is the premise of primary author Mark Brody in "Mosaic Garden Projects," co-written with Sheila Ashdown. Both authors, along with photographer Justin Myers, whose work is a critical part of this book, are Portland residents.

Wisely, Brody starts his orderly series of lessons with one on defining your working space. You must have a dedicated space because mosaics take room and some time to complete: You can't just pick up the project to make room for dinner! You will need tools and—if you jump in with both feet—you'll need lots of tools, and places to put them. Good lighting, excellent ventilation (some of the materials are smelly), and a handy source of water are other necessities.

If you've completed this checklist, you're set to go. The book's excellent close-ups introduce the tools, the various types of tesserae (the pieces

that make up the mosaic), and other critical parts. These include the substrate that supports your art, such as the marvelously garden-sounding wedi (pronounced "weedy") board, the adhesives to attach, and the grouts to fill in the gaps.

There are instructions on creating the image, with many templates to help, but filling the bulk of the book are projects. In my experience, many do-it-yourself books have a number of frivolous projects, but not this one. Each of the featured projects, ranging from easy to challenging, would deserve a place in your garden or home. The first project—and according to Brody the easiest—is creating a mosaic of your house numbers to welcome your guests.

Hops and Craft Beers

"Hoptopia" is the intriguing name of a well-researched and documented new book by Peter Kopp that tells the history of growing hops, particularly in the Willamette Valley of Oregon. To set the stage, the author reviews the natural history of hops, including *Humulus lupulus*, a widespread species native throughout much of the north temperate world, including North America, but not originally found in our region.

This all changed in the mid-19th century with the rise of hop farming in both Oregon and Washington. Puyallup, Washington, was an early center for this crop. Residents of that city are likely aware of their historic Meeker Mansion, but perhaps they do not know that its builder, Ezra Meeker, was the "Hop King" during the 1880s.

In the 20th century, prohibition threatened to destroy this industry. However, the opposite happened, because of the rising demand for the American crop in war-torn Europe. By the 1930s, hop growing was at its peak in the Willamette Valley, celebrated by the Hop Fiesta in Independence, Oregon—an event revived in this century. There were challenges, too. The extreme physical demands of harvesting hops led to strife between labor and management. Downy mildew required the breeding of resistant varieties, a process that did not have significant success until the 1970s.

Today, the regional center for hop growing has shifted back to Washington. Indeed, the greater Yakima Valley is now, by far, the largest producer of hops in the world. Meanwhile, Portland has proclaimed itself "Beervana" for its many small breweries as, according to Kopp, "... there is little question that the hop became the signature ingredient of the craft beer revolution."

Birding: Two New Books

The popularity of birding in our region sparked the release by major regional publishers of two new birding books with nearly identical titles. Published in 2016 by the Seattle Audubon Society and the University of Washington Press is "Birds of the Pacific Northwest: A Photographic Guide," by Tom Aversa, Richard Cannings and Hal Opperman. In 2017, Timber Press continued their "Field Guide" series with "Birds of the Pacific Northwest," by John Shewey and Tim Blount.

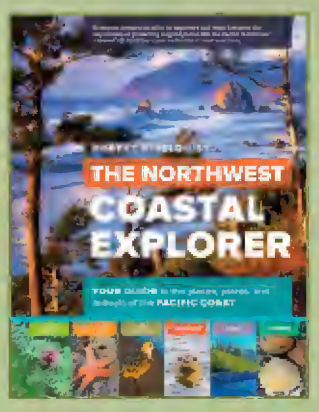
Confusing? Yes. And, as a minimal birder, I don't feel qualified to make a recommendation between the two, especially since—to my eye—they share more similarities than differences. If you are serious about identifying the birds in your garden or on your local travels, you clearly need both books!

The photography is one of the outstanding features of both, and the photos capture a very wide range of species, often with multiple images to show variation in sexes, juveniles, breeding plumage, and other color forms. Throughout, there is help with identification between near look-alikes, and the authors address behaviors, bird songs, specifics on where to find rarer birds, and conservation status.

The Audubon book includes an excellent essay on the climate, geology, and ecology of different sub-regions in the Pacific Northwest, especially as they pertain to the birds found there. It covers a bigger area, extending the region eastward to the continental divide. I like that each photograph includes both the location by county and the month taken.

The Timber book includes helpful and practical introductions to most species. For example, in discussing the American Crow (*Corvus brachyrhynchos*) and the Northwestern Crow (*C. caurinus*) the authors conclude "... they are indistinguishable" and, if you want to add the latter to your life list, "the safe bet" is to go to a place, such as Vancouver Island, where they predominate." While the book is a bit on the large size for a field guide, the heavy cover will help protect it from the weather.

Championing Coastal Plants



The Pacific Northwest is blessed with considerable coastline, both on the open Pacific and the shores of the Salish Sea. While beautiful, the coastline might not be the first place a gardener would think to go for inspiration. But Robert Stellquist's field and travel guide, "The Northwest Coastal Explorer," may change that attitude.

The author engagingly introduces unique plants from a range of maritime, coastal forest and riparian habitats, ranging from seaweed to conifers. He includes kelp, eelgrass and pickleweed—all plants that have adapted to a very specialized marine environment.

Steelquist understands that these plants, while rather odd-looking and perhaps not as appealing as the animal life, have an equally important role in the coastal ecosystems. If you see, on the water's surface, the floating stems and bulbs of bull kelp (*Nereocystis luetkeana*), then "... what's underneath is as lush as any rain forest."

Brian R. Thompson is the manager and curator of the Elisabeth C. Miller Library of the University of Washington Botanic Gardens. He is also a member of the "Bulletin" Editorial Board.

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